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innovation &energy

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Geothermal, solar and forest energy for innovative building

The DEUBAUKOM will be the building industry's kick-off event for 2014. More than five hundred companies, associations and institutions will be spotlighted at this international construction fair to be held at the Essen exhibition centre from 15 to 18 January. The link between building and energy will be particularly apparent on EnergyAgency.NRW's stand (Stand 241, Hall 2). The "Heat Pump Marketplace NRW", the "Photovoltaics NRW" and "Wood Pellets NRW" campaigns, the new "KWK.NRW" CHP campaign, and experts on the energy-modernisation of buildings will be there to provide information. Internet: www.deubaukom.de

2014 "Future Fuels" congress

The German Bioenergy Industry Association (BBE) in co-operation with EnergyAgency.NRW is organising its eleventh industry platform for bio-fuels in Berlin from 20 to 21 January 2014. More than five hundred international representatives from all market segments will be taking this opportunity of exchanging ideas and experience during International Green Week. The focus will be, inter alia, on new production routes for bio-fuels from by-products and waste, the political and economic boundary conditions, and certification. Further information: www.kraftstoffe-der-zukunft.de

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Pfarrer Klaus Breyer
Head of the Institute for Church and Society of the Evangelical Church in Westphalia

"Energy-state" NRW, with Germany's first-ever climate-protection act, is a much admired location for the transition in German energy supplies. The appurtenant consultation process is exemplary: representatives of industry, trade, the manual crafts and agriculture, the municipalities, environmental and social organisations, up to and including the state's more than 17 million citizens, are expressly enjoined to shape the necessary transformation together; the churches are, of course, also involved. Our social commitment to a sustainable and socially just energy turnaround and to climate-protection is tightly linked to our "action begins at home" philosophy. Numerous climate-protection campaigns and projects in parishes, in church institutions, within our world-wide ecumenical work and in our activities with young people provide impressive proof of this. In every case, the emphasis is on the assumption of real responsibility for the world God has entrusted to our stewardship.

Just as commercial companies aim to minimise their environmental impact with certified environmental and energy management, the parishes and church institutions are also continuously and systematically concerned with the preservation of Creation. They use methods which adapt proven systems - such as EMAS - to the special needs of the church. The "Green Cockerel" environmental management system has, for example, already been successfully introduced in more than 120 parishes in the Evangelical Church of Westphalia. Purchasing is now orientated at many locations around ecological and equitable criteria. The number of users of a recently drafted church energy-management system has also started to grow. The Evangelical Church of Westphalia in 2008 met the challenges of climate change by defining clear climate-protection aims, adopting the federal government's targets of 40% reductions in greenhouse gases in the 1990 to 2020 period for its territory and evolving its own climate-protection concept. The operation of around 5,000 church-owned buildings and, for instance, the road traffic caused by church employees, generate climate-relevant emissions comparable to those of a small town. As in many municipalities, climate-protection managers, both male and female, are active on behalf of the church, providing systematic advice for parishes, church groups and church social and educational personnel, and assisting in the introduction of an energy-management system. Their extremely good and close co-operation with EnergyAgency.NRW is also an important factor in achieving success here.

Climate-protection is a joint task! And it is a task that requires dependable, clearly defined boundary conditions. We, as a church, intend to make our contribution in society and "in our own house", to ensuring the success of these endeavours. I wish you much enjoyment and interesting reading in this edition.

Pastor Klaus Breyer

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Energy-efficiency at parish level

"Church is many things", according to a well-known German saying. Another tells us: "Active climate-protection is more than a new heating system and switching lights off". Together, these aphorisms characterise extremely well the diverse range of church climate-protection activities.

This range includes many predominantly "technical" projects, such as the conversion of the "Christuskirche" church in Heinsberg to passive-house standards, and the photovoltaics system installed on a meeting house in Mülheim, with 100 per cent on-site consumption. But just as much a part are more "behaviour-orientated" projects, such as the introduction of an energy management system in the parishes.

NRW's churches own large building complexes with significant energy needs.

The churches are one of NRW's largest property owners - they probably own more than 25,000 buildings in the state, predominantly churches, community centres, nursery schools and residential properties. Not a few of these buildings have significant energy needs; the energy-costs of all church-owned buildings, taken together, probably amount to around 170 million euros. This, admittedly, breaks down to "only" just on 30,000 euros for each individual parish, but that is, nonetheless, a goodly burden to be borne by the local church community.

Up to 40 per cent of the energy consumption that causes these costs could be saved: the first around 10 per cent by introducing an energy-management system, such as the "Green Cockerel", for example - plus another 10 per cent by modifying user behaviour. The other approx. 20 per cent require investments, in the form of new buildings or modernisations. We may mention not only the passive-house church and the solar-power installation on the meeting house already noted as examples of this, but also the wood-pellet system now in use at a parish in Essen.

Expert support and assistance for the parishes is vital if these savings potentials are to be achieved to the full. "It is important that the work of those active on an honorary basis in the parishes be enabled and supported. They are usually laymen and women, and are highly motivated, but ultimately 'semi-professional', individuals managing technically demanding buildings. Providing the best possible heating in churches without causing damage to the furnishing and fittings - such as the organ, for example - is no trivial matter. The honorary members responsible for this do need assistance", affirms Christian Dahm, of EnergyAgency.NRW, who advises church institutions and parishes on energy-efficiency. "We provide solid, reliable help, in the form of our advice, technical events and also, for example, in our 'Energy-savings in parishes' handbook", he continues.

Our energy expert also points out another useful effect: "The parishes are currently

From the crypt to the tip of the church spire - good energy management is the secret.

Church lighting harbours large savings potentials.

Churches are very special buildings - and here, too, energy-efficiency is vital.

generating decisive impulses for climate-protection. For those active in the parishes, the watchword 'the preservation of Creation' is not simply an empty phrase, but is, instead, an essential part of their philosophy", Dahm emphasises. Parishes are therefore an important partner in establishing and furthering the targets of climate-protection and energy-efficiency in society. "They are an ideal PR channel - there is scarcely any other institution that reaches so many different people. Parishes include numerous diverse groups: the parish council and the presbytery, the church elders, various groupings of church helpers, young people's and senior-citizens' clubs, choirs and craft-work groups. All these people, for their part, are active in their own specific environment, namely in local families, groups of friends and acquaintances, and in their jobs. So the 'ripples' carry a very long way", Dahm adds.

Projects for energy modernisation and for the enhancement of energy-efficiency have already been completed in many parishes in NRW and throughout Germany. The following article examines a number of examples drawn from practice. These projects are only the start, however - many parishes have not even begun to tackle the subject yet. There is therefore still a great dormant potential here.

Church climate-protection projects

Green Cockerel

From its beginnings more than ten years ago in only a few parishes, the "Green Cockerel" environmental-management system has now spread to almost the whole of NRW. More than one hundred and thirty parishes and church institutions in our state have adopted this environmental management system to the EMAS standard and are continuously pursuing even greater energy efficiency. Initially only parishes in the Westphalian evangelical church were involved, but the first round in the Rhineland has now also started. More information: www.gruener-hahn.net

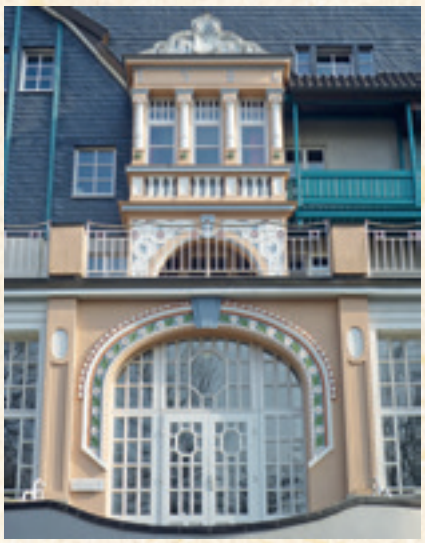
ECW's own climate agency

The climate-protection agency of the Evangelical Church of Westphalia (ECW) is a new force on the church climate-protection landscape. It was set up early this year and provides parishes with tangible assistance, among other things, in initiating energy management. The around 5,000 church-owned buildings in the parishes and the church facilities in the church's territory harbour an extremely large climate-protection potential. Energy management supplies important information on where savings are possible, and can thus restore a certain freedom of financial manoeuvre. The climate-protection agency is assisted by an advisory project committee on which EnergyAgency.NRW is also represented. Further information: www.klimaschutz-ekvw.de

"Die Wolfsburg" Catholic Academy in Mülheim an der Ruhr

The "Die Wolfsburg" Catholic Academy, the Essen diocese's adult-education facility, has now been meeting part of its own electricity needs for a whole year. Stephan Gill, the manager of this meeting house, had a 9.6 kW_p photovoltaics system installed on the roof. "It generates more than we expected. Originally, we were assuming an amortisation period of ten years, but if things go on as they have up to now, we will have recouped our investment in seven". Photovoltaics systems are a good idea for meeting houses, in particular; the significant fall in module prices means that power costs of 12 to 15 ct/kWh are now perfectly realistic. Current electricity rates for public facilities of this consumption range, on the other hand, are usually around 22 ct/kWh (incl. VAT) or more. The approx. 10 ct/kWh difference is what makes the project worthwhile. At the "Wolfsburg", the photovoltaics installation meets around 90 per cent of the kitchen's power needs.

The next project is already underway: a cogeneration-plant (CHP) unit is to be installed before the end of this year. This, too, is to be designed to permit the greatest possible internal use of the electricity generated. Photovoltaics and cogeneration are not competitors in such arrangements, in fact they complement each other: the CHP unit operates 24/7, and is dimensioned to very largely cover night-time power needs, without any feed-in. The photovoltaics system kicks in with support when the sun rises, daytime operation starts and power consumption increases steeply - ideal teamwork, in fact.



Passive-house church in Heinsberg

The Heinsberg evangelical parish was confronted with a challenge typical of many parishes: changing structures were making it necessary to rethink its number of buildings and their uses. The new focus of the parish was to be the Christuskirche church - that, however, would necessitate a thorough modernisation, and the addition of new assembly rooms. The planning work established that there was no suitable "standard" modernisation solution, since the overall concept included not only flexible

room utilisation, but also, as a central element, a stringent energy standard aimed at reducing energy-costs and environmental impact. The decision was thus in favour of modernising the around sixty-year old church to meet passive-house standards. Heinsberg therefore now has Germany's first passive-house church.

The total costs of the project amounted to some 1.35 million euros, the major portion of which was met by the sale of a building no longer needed. The "Bundesstiftung Umwelt" national environmental foundation also subsidised this pioneering project. EnergyAgency.NRW is supporting the associated publicity work, and has drafted a brochure containing the technical details.

Evangelical parish in Essen uses wood pellets

The Essen-Haarzopf parish's oil-fired heating system had grown old and, like the approx. 35,000 l capacity tank, needed replacement. "To cut energy-costs and CO_2 emissions, and also set an economic example", was the task undertaken by Frank Garlinsky, a member of the buildings committee, who then sought a suitable solution for the parish.

He received support from domestic fitter and master heating-engineer Holger Haupt, who has studied the topic of wood pellets since as long ago as 1999, and himself operates one of NRW's first pellet systems. For the parish, an 80 kW pellet-fired boiler was installed in the cellar of the nursery school and now heats the around 1,000 m² total area of this building as well as the parish community centre. The two buildings are linked by underground pipelines that transmit the hot heating water to the individual rooms. "A precisely planned energy concept for the pellet-fired heating system, plus an indoor room temperature regulation system for the underfloor heating circuits, with time-switches for the individual rooms, enables us to save around 30 per cent of our annual heating costs, compared to the use of a gas-fired water heater", Garlinsky reports.

The project, with costs of some 50,000 euros, was financed from a partially interest-free loan by the Evangelical Church of the Rhineland's environmental fund and a low-interest loan from the KfW bank. The new heating system will pay for itself in as little as six years.

Extra training for energy co-operatives

More and more citizens are becoming committed to the energy turnaround and thus wish to participate in citizens' energy facilities. These can be implemented in a range of different legal forms. The decision in many cases is in favour of a "co-operative". A "Project Developer for Energy Co-operatives" course has therefore also been available in NRW since October 2012, in order to support this development and provide specific assistance to interested citizens.

The idea for this training originated in the church sector. The Protestant Church Office for Education and Society evolved the course, and is implementing it with co-operation partners in a number of federal states; it also received the 2011 Solar Award for this successful project. The backer for this training project is the "Energy Turnaround Now" network, a co-operation project between the German Protestant Consortium for Adult Education and innova eG. In NRW; this training provision is supported by EnergyAgency.NRW.

The focus of training in NRW has up to now been on the initiation of energy co-operatives for the financing of photovoltaics installations. These activities are now to be further expanded: a wind-energy extension course for energy co-operatives is currently being prepared, and is to be offered in NRW as from the spring of 2014. More information: www.energiegenossenschaften-gruenden.de

Further training for pre-school carers

Very young children are also part of parish life. Just as the subject of energy is becoming ever more important for adults, it is also to be correspondingly featured in the parishes' nursery schools. The "Living energy in nursery schools" training

courses for pre-school carers aims to illustrate how children's interest in this topic can be aroused, and how they can be given their first insights, experience and perceptions into it by means of experiments, games and other fun activities. This practical seminar is available from EnergyAgency.NRW free-of-charge, and is held at the NaturGut Ophoven, in Leverkusen. More information: www.energieagentur.nrw.de/schulen

Energy-saving manual

The "Saving energy in parishes" manual provides detailed explanations and practical tips. This guideline, published by Christian Dahm and EnergyAgency.NRW via the oekom verlag publishing house, Munich, is already a "best-seller" (but at no cost!), with more than 10,000 copies already distributed, and a third edition currently planned. It can be obtained from the book trade or directly from oekom verlag.

EnergyAgency.NRW provides up-to-date information, tips and details of upcoming events on its "Energy in parishes" page at www.energieagentur.nrw.de/kirche, where you can also subscribe to the free email newsletter, which will then inform you at regular intervals on new support programmes, publications and projects.

InnovationCity Ruhr Bottrop has first future house

A 1960s building in Bottrop has been modernised to Energy-Plus House standards by RWE Effizienz under the InnovationCity Ruhr project. The aim of energy modernisation and the installation of ultra-modern decentralised energy-generation systems was that of cutting this building's previous energy consumption by 90 per cent. Thirty-three manufacturers supported it with their latest products. The use of sophisticated measuring equipment will demonstrate, across a period of two years, just how successful this modernisation has been and which elements of it achieve precisely which savings. The measurements are being performed by the Hochschule Ruhr West University of Applied Sciences. Innovative insulation has been fitted to the roof, facade and the interior rooms of the building, while the photovoltaics and geothermal heat systems are connected to storage facilities and the electric-vehicle charging station in front of the building provides regenerative energy, produced on-site, for electric vehicles. Beate and Christian Kewitsch, the owning family, utilise a user-friendly building-automation system to regulate light and heat consumption.

As NRW's building minister, Michael Groschek, noted at the inauguration in Bottrop: "Energy-modernisation of old buildings is one of the most important routes to saving energy and thus also cutting CO_2 emissions. Single-family and two-family houses hold great potentials, which can - and must - be exhaustively exploited".

Bernd Tischler, Lord Mayor of the City of Bottrop, added: "In Bottrop, we are shaping the energy turnaround from below with our Future Evolution House Plus. This beacon project achieves climate-friendly urban renewal in exemplary fashion. The Kewitsch family's single-family house should serve as an incentive to all of us to do something for the climate".

Innovative gearboxes from N

NRW wind-energy companies are admired not only for their ability to adapt to structural change, but also, and in particular, for their powers of innovation. New technological developments are vital for survival against international competition. A number of these gearing innovations for wind-energy installations (WEIs) were unveiled very recently at EnergyAgency. NRW's annual Wind Power NRW network conference: Matthias Deicke explained the functioning of the HybridDrive, produced by Winergy, of Voerde. He pointed out that ever larger installations are necessary - for wind-energy facilities in forests, for example - but that they become economically inefficient as from a certain size. For this reason, the Siemens Group company concentrated on developing a gearbox designed for mid-range generator speeds (100 to 700 rpm) and thus permitting smaller generators. The HybridDrive model is a gearbox+generator combination within an integrated drive system. Each of the two individual components achieves an efficiency of over 98 per cent, providing the basis for an overall system efficiency of more than 96 per cent. The prototype and series tests conducted at Voerde in recent months confirm these figures for the HybridDrive. The current 3 MW version of the HybridDrive has a rated torque of 2,550 kNm for a weight of approx. 34 tonnes. Combining the gearbox and generator makes it possible to design the drive train 35 to 50 per cent shorter, and saves 5 to 10 per cent in weight.

HybridDrive No. 1 for nacelle installation was delivered to the first customer in the summer of 2013. The Type W2E 120/3fc wind power machine, with a spinner height of 100 m and a rotor diameter of 120 m, was installed near Rostock in September, 2013. It was developed by w2e "Wind to Energy Rostock", and went on line on schedule in the following October. Component certification for HybridDrive was conducted

Dr. Norbert Verweyen, director of RWE Effizienz GmbH, emphasised that the aim of this experiment is that of demonstrating the energy-efficient building and lifestyle of the future. The target, he stated, is to provide every house owner with something that he can copy. As Verweyen commented, "We have numerous examples to illustrate what is possible, and how it all works". The Future Evolution House was chosen in September 2012 in the context of the InnovationCity Ruhr "Future Evolution House" competition. More detailed information on this project, and a building logbook, can be found at www.energiewelt.de and www.zukunftshaus.org.

RW

in co-operation with TÜV Rheinland. Winergy is the leading drive-train manufacturer for wind turbines, with more than 70,000 gearboxes supplied world-wide and thirty years of experience. Its product portfolio covers the 750 kW to 6.5 MW output range, and is backed up by service tailored to the operator's needs.

Other topics at the event included a study performed by the International Institute of the Renewable Energy Industry (IWR), of Münster, on the subject of "Municipal repowering challenges" and the "Wind-energy and species diversity" guidelines to be published in the near future. An examination of innovative tower concepts closed the proceedings, after which five companies who only recently started activities in the wind-energy sector had an opportunity of showcasing themselves briefly to the plenary session.

Repowering challenges municipalities

NRW has ambitious climate targets for the ongoing energy turnaround. The use of wind energy plays a decisive role here; its share in overall power generation is to rise from its present 4% to not less than 15% by 2020.

Particular importance will attach to the "repowering" of wind-energy installations, i.e., the replacement of older systems by more efficient and more productive ones, for the attainment of this expansion target.

To support repowering, the NRW state government has initiated a "Repowering Initiative" as part of its climate-protection start-up programme. Assistance is to be provided, in particular, to municipalities in implementing repowering projects. The International Institute of the Renewable Energy Industry (IWR), of Münster, has for this reason been commissioned to obtain information from the 396 municipalities in NRW on completed repowering projects, planned repowering activities and obstacles in the repowering of wind-energy facilities (WEIs). The response rate to this survey, conducted in the autumn of 2012, was extremely pleasing, at 82 per cent, thus generating a useful picture of wind-energy planning and repowering activities in the state, and reflecting the municipalities' high level of interest in the subject of repowering.

The obstacles to repowering were isolated and recommendations for action on the following topics derived, in order to provide assistance to the municipalities: urban and rural conditions, biodiversity, leasing and participation models, relations with existing investors, and the population's acceptance of wind-energy.

EnergyAgency.NRW, in co-operation with the state's climate-protection ministry, organises regular information events for all those involved in repowering projects and confronted with these challenges.

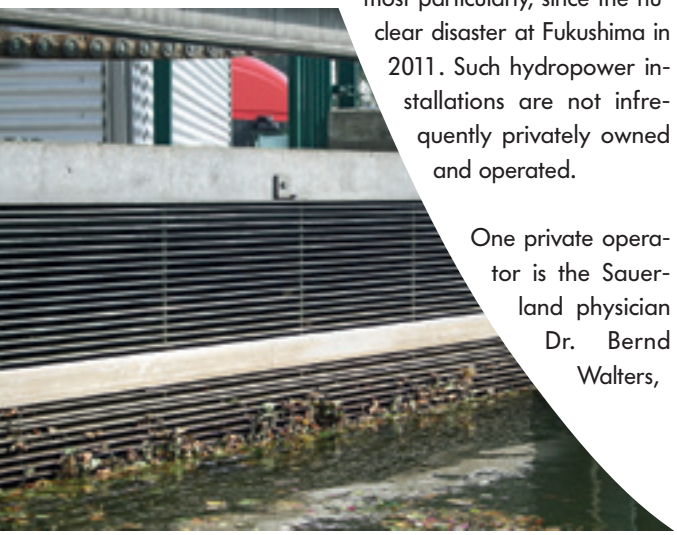
In addition, an information and advice platform on all matters concerning the expansion of the use of renewable energy is available to the municipalities, and also to private companies and the state's citizens, in the form of the EnergyDialogue.NRW. The scope also covers topics such as participation models, relations with existing investors, and the involvement of the populace, with the aim of enhancing acceptance of the use of wind-energy.

The "Wind-energy and biodiversity" guideline, to be published in the near future, is a further step on the road to greater planning certainty for repowering projects and to the standardisation of administrative practice.

The municipalities will then be able to meet the challenges presented by repowering more easily. NRW is thus on the right road for further developments in the repowering of wind-energy installations with its Repowering Initiative founded at an early stage by the state government.

New hydropower plants in the land of a thousand hills

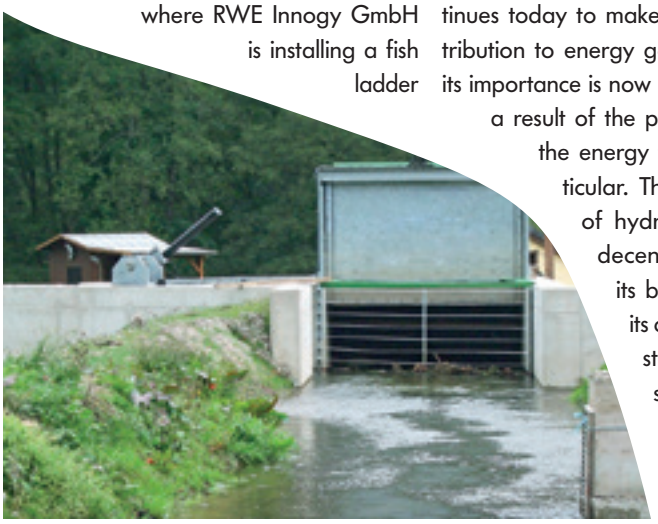
Hydropower has a long history in the Sauerland, and was long the primary source of energy, alongside muscle power. This region's topography, with numerous hills and rivers, provides ideal conditions for the operation of water mills and hydroelectric plants. Even today, this form of energy generation has lost none of its significance - on the contrary, it has, in fact, become even more important, in the context of the energy turnaround and, most particularly, since the nuclear disaster at Fukushima in 2011. Such hydropower installations are not infrequently privately owned and operated.



One private operator is the Sauerland physician Dr. Bernd Walters, who owns a total of seventeen hydropower plants. One of his latest projects is located on the River Diemel, in Giershagen, part of the town of Marsberg. With a head of 4 m, a design water flow of 2 m^3/s is projected onto a Francis turbine. The system has an installed capacity of 70 kW and is designed for annual energy generation of approx. 350,000 kWh/a, sufficient to supply around ninety households, each with an average electricity consumption of 4,000 kWh, each year. This new hydropower plant is currently undergoing operating trials.

Another example is the hydropower screw at the Niedermühle mill in the Marsberg district of Padberg, also on the Diemel. This project was initiated and implemented by Johannes Langen, of Bad Wünnenberg. This system, with an installed capacity of 30 kW and a head of 3.10 m, is designed for an annual output of approx. 150,000 kWh - enough to supply just on forty families with their average electricity needs.

Things are also happening at the Alfert hydropower plant, near Bestwig, where RWE Innogy GmbH is installing a fish ladder to assure the hydro-ecological continuity of the River Ruhr. This system, with an installed capacity of 270 kW, will generate some 600,000 kWh of electricity each year.



Both the planners and operators of these projects devoted great attention from the inception to the requirements of the European Water Framework Directive (2000/60/EC). Fish are protected against being drawn into the plant machinery by a fine-mesh screens installed immediately upstream the turbine or the hydropower screw, for example. Fish barriers on the downstream side are intended to guide migrating fish into the correct channel leading upstream. These fish barriers consist of a combination of large and small stones - so-called spoiler stones - which modify the main current in the river in such a way that the fish are diverted naturally around the hydropower station.

Stefan Prott, a hydropower expert at EnergyAgency.NRW, is impressed by the dedication of these Sauerland operators: "The hydropower facilities in the Sauerland underline the fact that hydropower continues today to make an important contribution to energy generation, and that its importance is now increasing again, as a result of the powerful impulses of the energy turnaround, in particular. The special strengths of hydropower include its decentralised character, its base-load capability, its capability for energy storage, and its grid-stabilising function. This is the reason NRW is backing the hydro-ecologically responsible expansion of hydropower and the optimisation of existing installations". ■

Stricter new buildings standards

Federal government passes Energy Saving Ordinance

The "outgoing" federal government passed the amendment to the Energy Saving Ordinance (Enova) on 16 October 2013.

The most important changes include the raising of the energy-efficiency requirements for new buildings by a once-only amount of 25 per cent of the permissible annual primary-energy consumption with effect from 1 January 2016, the augmentation of the "energy pass" with a sliding scale (energy-efficiency classes from A+ to H) and more stringent modernisation requirements for existing heating boilers, plus a mandatory declaration of energy-consumption data in advertisements for the sale or rental of properties.

In addition, urban authorities and municipalities must now make provisions for the fact that energy passes will have to be displayed in significantly more public buildings in future.

There was much long debate on numerous details of the amended regulation, since the EnEV is the most important instrument for increasing the energy-efficiency of properties. The amended regulation is expected to come into effect only in the early summer months of 2014. ■

Steam power a partner

The "power-generating plant of the future", incorporating the core virtues of "flexibility, efficiency and low environmental impact", will be an important element in the needs-orientated integration of power supplied from fluctuating energy sources. The Cluster Rhein Ruhr Power initiated the joint "Steam power plant in partnership" project on 1 September 2013 for the development of this concept.

This research project, an important one for the energy turnaround, is intended to develop new technical concepts for the modernisation of existing power-generating plants to enable them to balance out fluctuating electricity feed rates from wind-power and photovoltaics sources with certainty, and continue to guarantee grid stability.

Hand-in-hand with renewable energy

The expansion of the use of renewable energy is proceeding apace in Germany, but the installation of high-capacity power storage facilities is lagging behind. Fossil-fuelled (gas and coal) power plants will be required to perform important grid stabilisation functions during the transitional period. They are thus indispensable complements to renewable energy. But existing thermal power plants are capable only to a limited extent of the high-flexibility of operation needed to balance out fluctuating inputs from renewable sources. They must therefore be appropriately modified to enable them to meet these requirements in future.

Power plant of the future

What qualities will these power-generating plants need to do this? They will need to be able to start up and shut down quickly, to operate at extreme low-load levels and should also have the highest efficiencies possible at low loads. And, of course, all these combined with the lowest possible environmental impact and the highest possible cost-efficiency.

Power-plant operators E.ON, RWE, Steag and Vattenfall, power engineers Hitachi and Siemens, plus the scientific institutions DLR, EWI Cologne and the University of Duisburg-Essen, are participating in this project, which is receiving support from the federal ministry of economics under its COORETEC research programme. Contact: Margit Thomeczek, email info@rhein-ruhr-power.net ■

IT for enhanced efficiency

The energy industry is confronted with a whole range of challenges which must be solved if an efficient, safe, reliable and environmentally friendly energy system is to evolve; the use of information and communications technologies will play a key role. Corresponding developments will be necessary, and are being pursued within the Cluster EnergyResearch.NRW.

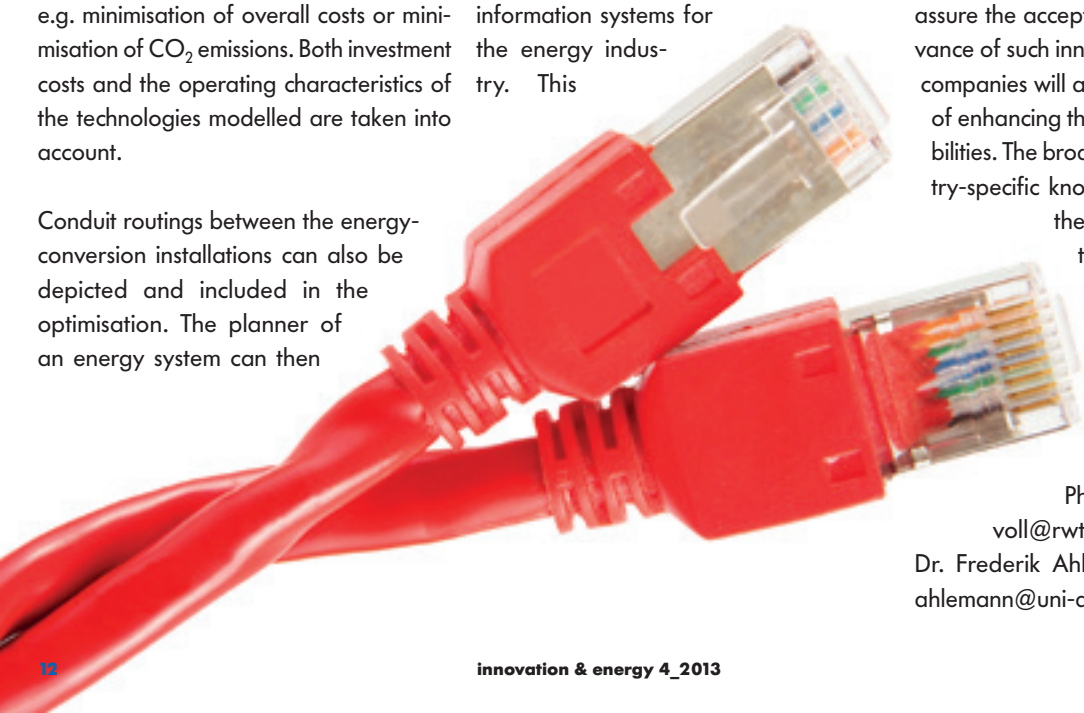
Due to their pronounced diversity and complexity, the energy systems of industrial estates, in particular, possess significant potentials for improvement of energy-efficiency, which can be exhaustively implemented by means of the appropriate networking of the energy-supply arrangements of the companies located there. In view of this fact, RWTH Aachen University has developed, in the context of the sOptimo "Structural optimisation of energy-supply systems using the example of industrial estates" project, a software package for the automated optimisation of such energy systems. This software enables planners to identify the optimum energy system for any particular application impartially from a practically infinite number of variants. The project is supported by the Federal Ministry of Economics and Technology.

Such optimisation can be based on a range of different criteria, at the user's option: e.g. minimisation of overall costs or minimisation of CO_2 emissions. Both investment costs and the operating characteristics of the technologies modelled are taken into account.

Conduit routings between the energy-conversion installations can also be depicted and included in the optimisation. The planner of an energy system can then decide what compromise between the use of primary energy and overall costs is to be accepted for the specific problem.

The focus at the University of Duisburg-Essen is also on innovative, platform-based IT systems for the energy industry. The scientists from the Ruhr have founded the IIS-4Energy workgroup with the involvement of the University of Mannheim for this purpose. This is a network of energy-supply utilities co-ordinated by the two universities. The network's aims include interchange of knowledge and the evolution of solutions for problems concerning all facets of the development, introduction and successful utilisation of innovative information systems for the energy industry. This extends among other things to concepts and topics such as "cloud computing", "software as a service" and specific software platforms. The workgroup intends to assist its members in boosting their own competitiveness via the use of modern IT systems, with the central emphasis on the tackling of the main challenges encountered in the energy sector, such as unbundling, incentive regulation and the energy turnaround.

The use of a common software platform presents software makers with an enticing opportunity of establishing entire software portfolios and comprehensive service packages on the market. The involvement of the user companies is also intended to assure the acceptance and practical relevance of such innovative IT systems. These companies will also have the opportunity of enhancing their own general IT capabilities. The broadly based energy-industry-specific knowledge available within the network will ensure that the focus at all times is on this highly specialised field of application - the energy industry - rather than on "generic" technological topics. Contact: Philip Voll, email philip.voll@rwth-aachen.de and Prof. Dr. Frederik Ahlemann, email frederik.ahlemann@uni-due.de



From lab to demonstration

100 CHP units for Bottrop

Model CHP test for CO_2 reduction started in InnovationCity Bottrop

At the very heart of the "Ruhrpott" (the Ruhr coal basin), in the "model city" of Bottrop, an InnovationCity Ruhr, the NRW state government is subsidising a beacon project which is intended to demonstrate the CO_2-reduction potentials of the use of co-generation (CHP) in residential and smaller commercial properties.

For this purpose, around one hundred micro CHP systems of extremely diverse technology and size are to be installed in a range of building types with differing insulation standards. The technically and economically best CHP-system/building combination will then be determined, taking account of user behaviour in each individual case. The boundary conditions for the analysis will be virtually identical, since these systems are all to be located in a single district. The aim is to draft a blueprint for other municipalities in the Ruhr, and in NRW and beyond. The project is being co-ordinated by the Gas- und Wärme-Institut GWI e.V., of Essen. Also co-operating on this project are Innovation City Management GmbH and the Hochschule Ruhr West University of Applied Sciences.

The GWI demonstration building

Installations in the basement

Installation, measurement, analysis and testing are being conducted in three stages: 1. GWI has already performed static and dynamic laboratory tests. 2. The data obtained was then verified and evaluated under authentic boundary conditions in the GWI demonstration building. 3. Ultra-modern CHP systems are now being installed, for operation and testing with scientific support, in one hundred buildings in Bottrop.

These buildings have been selected for their differing thermal-insulation standards, in order to study a representative cross-section. A range of different CHP technologies (gasoline and stirling engines, fuel cells) is being installed, in order to permit a "before-and-after" assessment. The following criteria will be applied: energy input and consumption, CO_2-savings potential, energy-efficiency, greenhouse-gas emissions, building suitability, plus ease of installation, servicing and use.

Manufacturers of CHP systems, the craft trades, energy utilities and Bottrop citizens are participating in this three-year project. All will benefit from the scientific liaison provided which, upon completion of the project, will be able to answer the question of which CHP technology can best be used in which property.

The project thus harmonises well with the NRW state government's CHP expansion targets, under which the amount of electricity generated in the state using CHP is to rise to not less than 25 per cent by 2020. The NRW climate ministry has for this purpose set up an impulse programme intended, via consultative services and opportunities for support and financing, to permit and expand the use of CHP technology. This project is, indeed, receiving support via this channel.

The "100 CHP-systems" project will supply important knowledge on the best technical, energy-related, ecological and economic use of CHP installations, with great potentials for influence even beyond the boundaries of NRW. Contact: Margit Thomeczek, email thomeczek@energieagentur.nrw.de and Frank Burmeister, email burmeister@gwi-essen.de ■

GreenTec Award

Ceramic Fuel Cells, an NRW supplier of fuel-cell-based micro power plants, recently received the renowned GreenTec Award in the "Energy" category in Berlin. Europe's largest environmental and industry prize, which was awarded this year under the patronage of federal environment minister Peter Altmaier, recognises ecological and economic commitment, and the effective use of environmental technologies.

BlueGEN is a natural-gas fuel-cell micro power plant designed to supply residential properties and smaller enterprises with heat and electricity efficiently and environmentally safely. The heat generated is used to heat water, while surplus electricity is fed into the grid. ■

Curse or blessing?

Imported wood pellets

More than 24,000 wood-pellet heating systems have now been installed in NRW, and the trend is a rising one - wood pellets have everything you would expect from a modern fuel: they are cost-efficient, easy to use, environmentally friendly and crisis-proof. Burgeoning demand for them has long been met not only from domestic sources, but also from abroad. But does the importation of wood pellets negate the tiny tablets' sustainability image? And are these imports a threat to German producers? Two medium-sized pellet suppliers, from the Westerwald and Rureifel regions, respectively, comment:

Markus Mann,
CEO of Westerwälder Holzpellets GmbH

Changing reading habits - goodbye book and newspaper, hello eBook and Internet - are having a global impact, with numerous paper mills having to close around the world. Countries such as the USA, Canada and the Baltic states are therefore looking for new uses for their low-price wood. Imports are most definitely serious competition for domestic producers, but the German market is also "cushioned" by the logistical challenges involved, and by the inevitable loss of quality caused by repeated transhipment of these pellets. Importation does not necessarily cancel out the sustainability of these pellets. There are many, generally positive, examples abroad of great importance being attached to sustainable ecological forestry and processing, and to the environmental standards of the shipping capacity used. I personally had a more "negative" experience at a plant in France which uses a coal-fired grate to dry the wood shavings, and then compresses the pellets using nuclear-generated electricity. You have to look closely at how the pellets are made and who is supplying them - certification procedures, such as the "Blue Angel" and the Carbon Footprint environmental symbols are, unfortunately, not yet in sufficiently wide use.

For the consumer, the internationalisation of the market is, in principle, a positive development. He or she can now be sure of a genuine market price for wood pellets. I would hope, however, that customers will question the pellets' origins and the manufacturing methods used, and have both put down in writing. Green electricity and green heat for drying of the shavings are mandatory for wood pellets from the Westerwald.

Markus Mann

Tom J. Eggemann,
Managing Shareholder of MegaPellet Energy GmbH

Rising imports of wood pellets present our company with significant challenges. MegaPellet stands for regional materials flows and added value, with a fair product price at the same time. The very basis of our production is domestic feed materials from sustainable sources, combined with short transportation distances and a good CO_2 balance. And we score with our customers with these arguments. Public purchasers ignore these aspects, however. Only a guaranteed price and a maximum contract term, with no indexing clauses, generally play the decisive role in orders. In many cases, we, a company with ENplus-certified production, are no longer able to win orders for high-quality regionally produced pellets. Offering such customers imported pellets, on a trade basis, could be a possible solution for us in the future.

I don't envisage the total elimination of domestic production as a result of pellet imports, but sales difficulties caused, for instance, by the loss of major customers, will thin out the ranks of local producers in the mid-term, and thus favour oligopolistic structures. The customer can only benefit, as long as domestic and imported pellets continue to compete with each other. The precondition is, however, that the imported pellets meet the high quality standards that apply, even after a long period in transit and repeated transhipment, and are declared for sale as imported products, because only this enables the consumer to make a conscious choice.

Tom J. Eggemann

Hydrogen for energy storage and fuel

The rapid expansion in the use of renewable energy as part of the energy turnaround is assigning ever greater importance to hydrogen as a medium for energy storage. Used as a fuel, this gas is an important link between surplus renewable energy and zero-emissions mobility.

Thanks to their highly efficient electrical propulsion technology, fuel-cell vehicles running on hydrogen achieve high ranges (300 to 500 km) and short tanking-up times (three minutes). Hydrogen's high energy density and availability also make it possible to store large amounts of energy on a seasonal basis, whether in man-made storage facilities or salt caverns. Compared to on-site power (re)generation, feed-in to the natural gas grid or even conversion to synthetic methane, the use of hydrogen recovered by means of electrolysis as a vehicle fuel is notably climate-friendly and economical. A good 30 per cent of the original wind energy reaches the wheel when H2 is used in fuel-cell vehicles, but only 10 per cent if natural gas is firstly produced from wind-hydrogen via methanisation, and then used to fuel internal combustion engines. The setting-up of the necessary infrastructure also creates new business models, but requires inter-industry co-operation and public support.

One hundred and forty experts from the fields of energy and local transport met in Herten in October to discuss the potentials of hydrogen. Well known companies and scientists examined electrolysis, hydrogen technology and vehicles, and also outlined technological trends and operating experience. It became apparent that hydrogen will evolve into a realistic option for the supply of local vehicle fleets before the end of this decade. The focus in fleet operation was on local public transport, and on two fuel-cell powered buses and a diesel/hydrogen hybrid bus, all of which are already in everyday service in NRW. Another example of the models on show is to be introduced next year. Operating trials have shown that the technology is now ready for its market launch. A number of vehicle manufacturers also showcased fuel-cell cars ready for series production. The first models are already available on the market, and the large Japanese and German car-makers are to follow suit from 2015 and 2017 onward, respectively. The necessary infrastructure also exhibits intensive competition between a range of technologies and manufacturers.

As Dr. Thomas Kattenstein, head of the Network Fuel Cell and Hydrogen NRW at EnergyAgency.NRW, noted: "Hydrogen offers us the opportunity of also using renewable energy in significant quantities for transport purposes, and thus of achieving genuinely zero-emissions mobility throughout the fuel production chain. Local energy suppliers will be able in future to market hydrogen as a fuel, and supply local public transport operators, for example".

Volker Lindner, chairman of the h2-netzwerk-ruhr network in Herten, also added: "The Ruhr, in particular, with its highly developed industrial use of hydrogen, provides especially good conditions for the establishment of green hydrogen infrastructures. The market launch must now be pursued more intensively than has been the case up to now, in order to achieve a transition to series production at rational cost levels. A coordinated procurement programme for buses would be a great step forward here". Further information: email weber@energieagentur.nrw.de

Partner exchange bioenergy

EnergyAgency.NRW launched its new Partner Exchange Bioenergy project in September as a special feature of its "BioenergyForum NRW". Project initiators and interested parties from the fields of research, development, finance, supply, processing and consulting, along with prospective energy users, had the opportunity of presenting their project ideas and contacting potential collaborators. Around thirty requests for project co-operation were submitted prior to this conference; even more interested parties came forward during the event itself. One of these was a farmer who is working on an innovative concept for biogas generation incorporating 100 per cent recycling of biomass digestate. Thanks to the project-partner exchange he was able to contact companies who can provide a new concept for 100% digestate recycling and also the technology to permit energy-route utilisation of digestate pellets. In addition, an insurance company is examining the question of whether it can underwrite the risk and insurance management for the project - all in all, a good example of the successful functioning of the project-partner exchange.

There were radiant faces at the BioenergyForum NRW of EnergyAgency.NRW because the conference offered a highly informative programme. With several sessions the conference held the representatives from this field spellbound – not least thanks to the genial moderator Sven Plöger. But as a meteorologist Plöger couldn't resist giving the conference participants tomorrow's weather forecast as well.

The organisers from the Biomass NRW network were extremely pleased by the participants' positive response. "We would like to establish the Project-partner Exchange Bioenergy permanently and even bring people from outside our annual conference together systematically", commented network director Heike Wübbeler. Those interested can submit their requests for contacts using the form available at www.biomasse.nrw.de. The Network Biomass will then assist them in their search for suitable project partners. More than two hundred and fifty industry representatives took part in the first supra-sector annual "BioenergyForum NRW" conference in Düsseldorf in September, an event which clearly illustrated the importance of the "all-rounder" biomass as an economic factor in NRW, and also outlined routes to enhanced efficiency in its use for energy generation. Conference documentation can be found at: www.biomasse.nrw.de/jahrestagung ■

Berchum and the BINSE

Berchum is a little out of the way, maybe even a bit of a "backwater": there's a church square, fresh bread rolls from the local baker at 6 a.m. every day, a pub offering good German food, and the local paper sings the praises of the village's athletics club. Berchum is a 30 km limit zone, a tiny island situated almost exactly between the A45 autobahn on the right, and the A46, on the left. Its streets are narrow and winding, and carry the visitor uphill and down dale. This outlying part of the city of Hagen is by no means behind the times, however; it is, on the contrary, actually ahead of them, so to speak. Berchum is, in fact, a solar village, thanks to the "BINSE", the residents' solar-energy initiative.

In Berchum, virtually nothing to do with energy does not now involve the BINSE. Spokesman Dr. Helmuth Küffner positions himself on the meadow in front of the primary school, and does exactly what a spokesman is intended to do - he speaks. The retired psychologist and co-founder of the BINSE has something to say about everything. "Solar shade, for example", he says, pointing to the school, and continues effervescently: "This was one of our first projects". At that time, ten years ago now, the City of Hagen could not afford to protect the pupils against the summer sun with window awnings. Window awnings are expensive. The BINSE came up with a cheaper and, at the time, almost revolutionary (but since repeatedly acclaimed - and copied) idea: providing shade using photovoltaics, in the form of semi-transparent thin-film modules. The planning and implementation were all the work of the BINSE. "Since then, it's five degrees cooler in the classrooms in summer". The only drawback, he says, is that the

State-wide wood pellets week

EnergyAgency.NRW's "Wood Pellets Campaign" celebrated its tenth anniversary this year. And quite rightly, as the second "Wood Pellets Week" in October demonstrated, with more than 750 events held throughout the state.

Pellets "dominated" the NRW news a whole week long recently. The WDR 2 station broadcast radio spots inviting people to visit "Everyman's boiler room" in their neighbourhood, posters bearing the image of the Peter Pellet mascot passed on the message that "Wood pellets provide environmentally friendly heating here". And all this because more than 750 citizens had taken up EnergyAgency.NRW's invitation to join the wood pellets campaign and show their wood-pellet heating system to interested neighbours and visitors. For a whole week, the more than 750 participants, in tandem with a range of information events, thus made NRW the scene of the world's largest "boiler room show".

Peter Knitsch, under-secretary of state at the NRW Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection, had opened the second state-wide "NRW Wood-Pellets Week" with a visit to Berchum: "Wood pellets are an entirely viable alternative to oil and gas. They have the great benefit that users are then freed from dependence on fossil fuels and their price fluctuations. A kilowatt-hour of heat from pellets is also comparatively cheap, it costs around a third less than the same amount of energy from fuel oil. Sustainable and ecologically responsible energy supplies necessitate gradually increasing independence from the fossil energy sources of coal, oil and gas. Wood pellets are an important step in this direction, they are ecologically sound, and can contribute to wealth creation in our region", Knitsch continues.

Not only private users, but also, of course, manufacturers, manual craftspeople and trade companies throughout the state also took the opportunity during the Wood Pellets Week to obtain information on the benefits of these tiny wooden tablets. Those interested were able to gather information without any great effort - first hand and, so to speak, just round the corner.

It was no coincidence that Peter Knitsch opened the Wood Pellets Week in Berchum. Since its founding in 2002, the "Berchum Initiative for Solar Energy" (BINSE) has actively accelerated climate protection "in its own backyard". "Wood is a regenerative source of energy, and will remain rationally priced in the long term", adds Isabel Dörr, EnergyAgency.NRW's head of the wood pellets campaign. "In addition, the system hardware is mature, and easy to use. The bottom line is that this climate-friendly heating technology is extremely interesting and attractive". More than 24,000 pellet-fired boilers have now been installed throughout NRW, earning the state third place in this field in the Federal Republic of Germany. ■

pupils now no longer get a day off when it's too hot. Another solar-power installation on the primary school, commissioned in 2012, supplied 16,000 kWh of electricity during its first year of operation. Berchum's PV systems now feed more than 500,000 kWh into the public grid, year in, year out.

The list of projects is also growing from year to year. A co-operative scheme between the parish and the BINSE has, for example, resulted in a new heating system for the church meeting house. Money was available only for the cheapest possible replacement when the ageing predecessor system finally breathed its last a year ago. "And that would have meant oil", continues Dietmar Buxhoidt, church elder and treasurer of the village's protestant congregation. But: oil and the preservation of Creation? Not an option - that, at least, was the BINSE's conviction. So twenty sponsors, who shared the higher costs for the installation of a new wood-pellet heating system, were quickly found from the citizens' initiative.

The BINSE operates more than thirty pellet-fuelled heating systems in the village; the BINSE purchasing syndicate ordered 100 tonnes of pellets in 2012, approximately

equivalent to the energy content of 50,000 litres of fuel oil. The pellet-fired boiler in the meeting house has an output of 48 kW, the two boilers in the young people's training workshops 100 kW each. Further information: email doerr@energieagentur.nrw.de ■

Five bioenergy-network managers – a portrait

Bioenergy-network managers in five NRW counties have set themselves the target of quantifying and mobilising local biomass potentials. The state government has already agreed to support a second project phase of the so-called "BEM" programme, in order to reinforce regional capabilities and concentrate them in a network.

Henning Steiner (BEM, County of Steinfurt), Julia Kinze (BEM, County of Wuppertal, Remscheid, Solingen and Mettmann), Dr. Petr Tluka (BEM, County of Wesel), Monika Löber (EnergyAgency.NRW), Andreas Hothan (EnergyAgency.NRW), Diana Achenbach (BEM, Bergisch County), Andreas Burkhardt (BEM, County of Unna), Ulrich Ahlke (Department of Climate Protection and Sustainability, County of Steinfurt)

The focuses of the bioenergy-network managers' activities are as diverse as the geography and structures of each region: while Dr. Petr Tluka in the County of Wesel aims to accelerate the energy-route utilisation of forestry management waste, Andreas Burkhardt in Unna pursues individual advisory services and project support for biogas installations. Concepts and recommendations for supplementary utilisation of heat are thus drafted in co-operation with system operators, specialist companies and planning consultancies. Diana Achenbach trains caretakers from all towns and municipalities in the Rheinisch-Bergisch and Oberbergisch counties on all facets of saving energy in buildings. She also co-operates closely with the universities of applied sciences in Cologne and in Leverkusen on the setting-up of a research laboratory, and organises information events together with the Chamber of Agriculture. Then there is Julia Kinze, who organises specialist events on the fermentation of horse dung and on wood-fired systems in residential construction in Solingen, Mettmann, Remscheid and Wuppertal. Or Henning Steiner, a BEM in Steinfurt who has, for example, established the www.energieholz-muensterland.de on-line marketing platform in co-operation with the Münsterland forestry association. The range of activities is broad, and the two-year project period not infrequently too short to permit the completion of all the activities started. Common to all BEMs is their enthusiasm for bioenergy, their understanding of the associated technologies, and pronounced networking at both regional and local level. They exchange information and opinions with each other and with EnergyAgency.NRW's Network Biomass at regular intervals. Information: www.biomasse.nrw.de ■

4.12.: NRW Climate Congress

The list of speakers includes many well-known names, headed by Hannelore Kraft. The Minister President of NRW is to address the "NRW Climate Congress" organised by the NRW Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection on the topic of the "Energy turnaround and climate protection as an engine of progress" in the City Hall in Wuppertal on 4 December 2013. The event, entitled "NRW Climate Congress - Shaping the future together" is being held in co-operation with EnergyAgency.NRW. In its NRW Climate Protection Act, the state of NRW has set itself the target of reducing greenhouse-gas emissions in North Rhine-Westphalia by not less than 25% by 2020 and not less than 80% by 2050, 1990 being the "base year" in both cases. "We can meet this target only if everyone pulls in the same direction and is prepared to make his or her contribution", affirms NRW climate minister - and event host - Johannes Remmel in the official invitation. A climate-protection plan defining specific spheres of action, strategies and provisions for the attainment of the climate-protection targets set out by the state is currently being drafted for NRW in a broadly based participation procedure involving more than four hundred persons. The role of regions in international climate-protection is to be illustrated, examining the example of the industrial state of North Rhine-Westphalia, with international guests at the "NRW Climate Congress". The way NRW is tackling "from below" the challenges of climate change with the drafting of this climate-protection plan is to be highlighted. The second phase of the participation process, in which it will be taken to a broad audience, and citizens, companies and municipalities integrated even more intensively into the drafting of the climate-protection plan, will also officially start. Registration is possible at www.klimaschutz.nrw.de/klimakongress2013 until 26 November 2013. Only a limited number of places are available. ■

Interview: Modified behaviour for the climate's sake

In Faust, Goethe depicted the dualism of emotion and intellect; Schopenhauer that between the will and the imagination, while Bismarck noted that his will had decided, even before his thoughts had reached their end. So if climate protection and the energy turnaround cause us headaches, can our intellect help out? We spoke to Prof. Dr. Gerhard Roth, a brain researcher at the University of Bremen.

Herr Roth, there seems, on the one hand, to be no end to the ever more alarming reports about climate change - most recently, the UN Climate Report. On the other hand, we are still struggling to accept the energy turnaround and sustainability. Can you, as a brain researcher, explain this to us in comprehensible terms?

These obvious contradictions are, in fact, perfectly normal. It is always difficult to modify human behaviour - the deeper it is embedded in a personality, the harder it is. Even assuming the message is totally clear and understandable, only a third of the population will usually relate it to themselves. Another fact is that, of this third, only one third will actually change their behaviour in response to the message. So there are two hurdles that need to be overcome: firstly: accept that the message affects me, and secondly: actually act on it. A complicating factor in the case of climate change and the energy turnaround is that there is no clear message.

What do you mean here?

Every report confirming climate change, for example, is followed by another report from industry or from the politicians casting doubt on climate change. In addition, the consequences of climate change are experienced directly by the individual only in exceptional cases. All of which means that climate change is far too rarely a perceptible factor in everyday life, if at all.

You say that contradictions are normal - on the one hand, that sounds as if there is still hope. But the scope of the approaching changes which you mention make one somewhat less optimistic...

I have seen a lot in my seventy-one years, and life has taught me, quite apart from any academic considerations, to be cautious. Most people will have learned from experience that caution is ultimately a sensible policy. This is also true of the energy turnaround - it is not sensible to get into a panic. And Fukushima is a long way away from us in Germany. The events there are too abstract to really arouse concern for any prolonged period. Our concern is aroused much more quickly, on the other hand, when our own pockets are affected. I have fitted triple-glazed windows to my holiday home, and that - and a few other improvements - resulted in energy-costs two thirds lower. I very quickly then had that feeling of contentment at having done something right and worthwhile.

Prof. Dr. Gerhard Roth is a professor at the Brain Research Institute of the University of Bremen. He was the founding rector of the Hanse-Wissenschaftskolleg (HWK) Institute for Advanced Study, Delmenhorst, from 1997 to 2008, and President of the German National Academic Foundation from 2003 to 2011 .

You have mentioned sense, and reason. Are we really sensible enough to take rational decisions?

We have to differentiate between reason and rationality. Our past life is an extremely important element in reason, even if it may not appear rational. Clever people are guided by experience, so it is not impossible to change things to achieve an energy turnaround. It does require a professional approach, however.

And where must this professional approach start? With reason?

No. I can't influence reason, that would mean trying to change people's experience after the fact - that, of course, is an impossibility. Instead, I must ask: What expectations and, in particular, what fears do people have - concerning radiation emissions from overhead cables, for example? So I have to take emotions, in the immediate sense, into account. Anxieties, for example, have their roots in people's own personal biographies, but that is not currently part of the calculation.

Do concerns about overhead cables teach us that recognition of threatening stimuli has a higher priority than recognition of neutral or positive stimuli?

Yes, the negative always has a significantly greater effect than the positive. It is precisely the perception of threats which must be taken more seriously in the context of the energy turnaround. We always assume the worst, to be on the safe side, when we need to assess contradictory information - this may, in fact, be a behaviour pattern that is particularly pronounced in Germany.

What role can the imparting of knowledge play here? Can knowledge dispel anxieties?

Knowledge can only be an accompaniment - we can't do without knowledge, but it is much more important to arouse images.

So we should impart moods, rather than knowledge, as Harald Welzer said?

Yes! Moods for positive examples and, above all: the examples must be drawn from the reality of our own lives. I've just said that Fukushima is a long way away from us, and what I meant by that was nothing less than that it is not really a part of our immediate surroundings. Even things that the German Chancellor says to me very quickly lose their importance if my experience within my own family is different. If a father plans to build a passive house and it doesn't work out, his children won't even try to build one. Positive examples in our perceptible life environment are the most important thing of all. ■

Master butcher backs CHP and solar power

Top-quality meat products are not the only consideration for master butcher Stefan Tönebön, of Barntrup, eastern Westphalia: his shop is adorned with appetising salamis, varieties of smoked and boiled ham, etc., but energy supplies are "anything but everyday" for Tönebön. A new combined heat+power (CHP) plant unit assures efficient heating and electricity. The CHP unit has an output of 45 kWth and 20 kWe. Surplus heat is temporarily stored in a 6,000 l buffer tank. Tönebön has, so to speak, travelled this road before: the new CHP unit is installed next to an existing one of the same ratings dating from 2007, and with service of some 8,000 hours each year. "In the summer, the older of the two has up to now only been in operation during opening hours. It's running all the time in winter, when the need for heating is greater", Tönebön informs us. The two units together meet 100 per cent of the shop's heating requirements. Tönebön no longer operates a heating boiler, but the steam-generation system can take over heat supplies in an emergency. The company, with its twenty-five employees, has an annual power consumption of 400,000 kWh, and energy is therefore a significant cost factor. "It is heating and refrigeration, as well as power, which use the most energy", explains Dipl.-Ing. Matthias Kabus, an EnergyAgency.NRW energy consultant. For this reason, among others, a photovoltaics system with an output of 11 kWp was installed on the roof in 2011. Tönebön's business is firmly rooted in the east Westphalian region: between seventy and eighty pigs from the surrounding area are slaughtered each week, in addition to three to four cattle. The CHP and PV installations do not mean that efforts here at enhancing energy-efficiency have reached their end; the company, which has sales of 2 million euros/a, also practises load management in order to flatten peak consumption. In addition, the master butcher is investigating the cost-effectiveness and technical feasibility of using batteries to store energy. This would make it possible to optimise the CHP unit's power production, again boosting cost-efficiency. "And the electricity generated overnight, and otherwise often fed into the grid, could then be temporarily stored for on-site use", Kabus concludes. Information: email kabus@energieagentur.nrw.de

Through Burbach with new energy

Council draws up climate-friendly transport concept

Since 2012, the municipality of Burbach, in NRW's historic Siegerland region, has been one of nineteen model municipalities throughout Germany participating in the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety's "Master Plan 100% Climate Protection" promotion programme. Burbach is pursuing the ambitious target of becoming virtually 100% climate-neutral by 2050. Greenhouse-gas emissions are thus to be reduced by at least 95%, and final-energy consumption by 50%, referred in both cases to the 1990 base year. The most recent and important working document is the "Climate-friendly transport" concept module, which is to be incorporated into the master plan. Work on it has been underway, in co-operation with the citizenry, politicians, companies and transport operators, since the end of last year. "We began work on this concept with a survey, to find out just what distances our citizens travel", says Burbach's mayor, Christoph Ewers. Letters were sent to a good 6,300 households, who were thus able to participate in the study. Around 13% of these households responded, returning the questionnaires with outlines of the routes they use. The citizens then discussed this information in workshops to evolve visionary ideas for the transport of the future, and thus play a direct part in co-shaping the transport concept. Various day-long campaigns, including one on "Electromobility", for example, were organised jointly with EnergyAgency.NRW in order to also draw public attention to the project. The working paper now includes specific measures, which are to be implemented by the persons responsible at local level. Additional facilities for cyclists are to be created, for example, charging stations for both e-bikes and electric vehicles set up, and projects started in co-operation with schools and nursery schools. "Walking not only helps the climate, it's also good for your health", affirms mayor Ewers, looking at the equipment of a local "walking bus". Further information: www.burbach-siegerland.de and www.kraftstoffe-der-zukunft.de.

A success: Citizens' Electromobility Day

Oberhausen's CentrO shopping mall was recently "taken over" by electromobility - the reason being the Rhine-Ruhr Citizens' Electromobility Day. The event, organised by the Electromobility Rhine-Ruhr project co-ordination centre, achieved its aim, despite initially poor weather: that of mobilising even more citizens for electromobility. Model Region Electromobility Rhine-Ruhr's projects were showcased in the wide expanse between the enormous "shopping temple" and the Metronom theatre.

The interest shown in new mobility was high: some 350 visitors took a test run to see for themselves that driving an electric car is not only ecologically and economically rational, but also quite simply enjoyable. Many were also happy to try out for free electric bicycles (Pedelecs), e-scooters and Segway PTs. In addition, an electric-car simulator was on hand to provide virtual motoring fun. Johannes Remmel, NRW Minister for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection, also visited the event and obtained comprehensive information on the projects. He saw for himself the holistic approaches taken by the projects in the model region, and affirmed that their participants are on the right road to the climate-friendly mobility of the future. Veit Steinle, head of the Department of Environmental Policy, Infrastructure and Sustainability at the Federal Ministry of Transport, Building and Urban Affairs, was there to gain an on-the-spot picture.

In all, well over one hundred electric vehicles were in use in NRW that weekend. The E Cross Germany 2013 rally, covering four stages, also stopped at the Oberhausen citizens' day to present a selection of around forty electric vehicles. EnergyAgency.NRW competed in this event in a Renault Fluence.

New from GET.Min: measure, train, evolve

The starting signal has sounded, and the first few metres are behind us: the Business Park Energy, Technology and Management Information Network (abbreviated in German to "GET.MIN"), a pilot project supported by the federal environment ministry, is now in operation in the first three municipalities.

The econius engineering consultancy is currently "quantifying" all the participating companies in the towns of Siegen, Viersen and Waldbröl, and holding the first training events. The participants are, for example, being further trained, free-of-charge and in a practically orientated way, and their awareness of the topic of saving energy heightened. In parallel, the Ruhr University Bochum is standardising the data obtained, and incorporating it into so-called industry modules, which will then form the basis for an Internet software platform.

Thomas Heider, GET.Min project manager at EnergyAgency.NRW, is pleased with the project's current status: "The development of the software - QuickCheck - is proceeding apace". Information: Thomas Heider, Tel.: +49 (0)202/24552-54, email heider@energieagentur.nrw.de, www.getmin.de

"The 2014 Fuel Cell Box competition"

In the 2013/2014 school year, EnergyAgency.NRW, in co-operation with H-TEC EDUCATION GmbH, will be organising the ninth "Hydrogen and fuel cells" pupils' competition in North Rhine-Westphalia. This year, the focus will be on the "Use of fuel-cell vehicles at airports", and is addressed to all school pupils in Years 9 to 11 in NRW. NRW climate minister Johannes Remmel is again the patron of the competition. Information: www.fuelcellbox-nrw.de

Siegen-Wittgenstein County: Climate-protection bus tour

Representatives from politics, government and various institutions were invited by the Siegen-Wittgenstein County for a bus tour to selected "climate" locations. This, the starting event for the drafting of a climate-protection concept, visited the participating municipalities to take a look at municipal and private projects either completed or planned and of particular relevance for the topics of energy and the climate. The first stop was in the town of Siegen, to view no less than two projects, the future Charlottenstrasse "climate-protection estate" and the "Berufskolleg Technik" technical college, one of the largest educational buildings in the whole of Germany, with a total floor area of 44,000 m^2.

Other visits included a wood-fired heating station on a commercial estate in Freudenberg, which supplies electricity to a large portion of the estate's commercial tenants, the Bad Laasphe municipal grammar school, which has been energy-modernised, and a primary school in Wilnsdorf, on the roof of which the South Westphalia Citizens' Energy Co-operative has installed a photovoltaic system.

The provisions for enhancement of energy-efficiency and the reduction of energy consumption at Heinrich Buhl GmbH, Neunkirchen, and a look behind the scenes at the Rothaarbad bathing complex's biomass plant in Bad Berleburg, also left a lasting impression. Another interesting visit was that to the Erndtebrück sewage treatment plant, where the digester gas yielded in drying of treatment sludge is converted in a micro gas-turbine to electricity for on-site use. The last stop was the Flender family's cogeneration plant unit, in the town of Netphen.

A nice touch: the mayors were there to welcome the delegation at each location visited. A small and friendly gesture, worthy of imitation, and one which underlines the importance of climate-protection locally and throughout the county. Those wishing to follow the progress of the climate-protection concept can do so at www.si-co2.de.

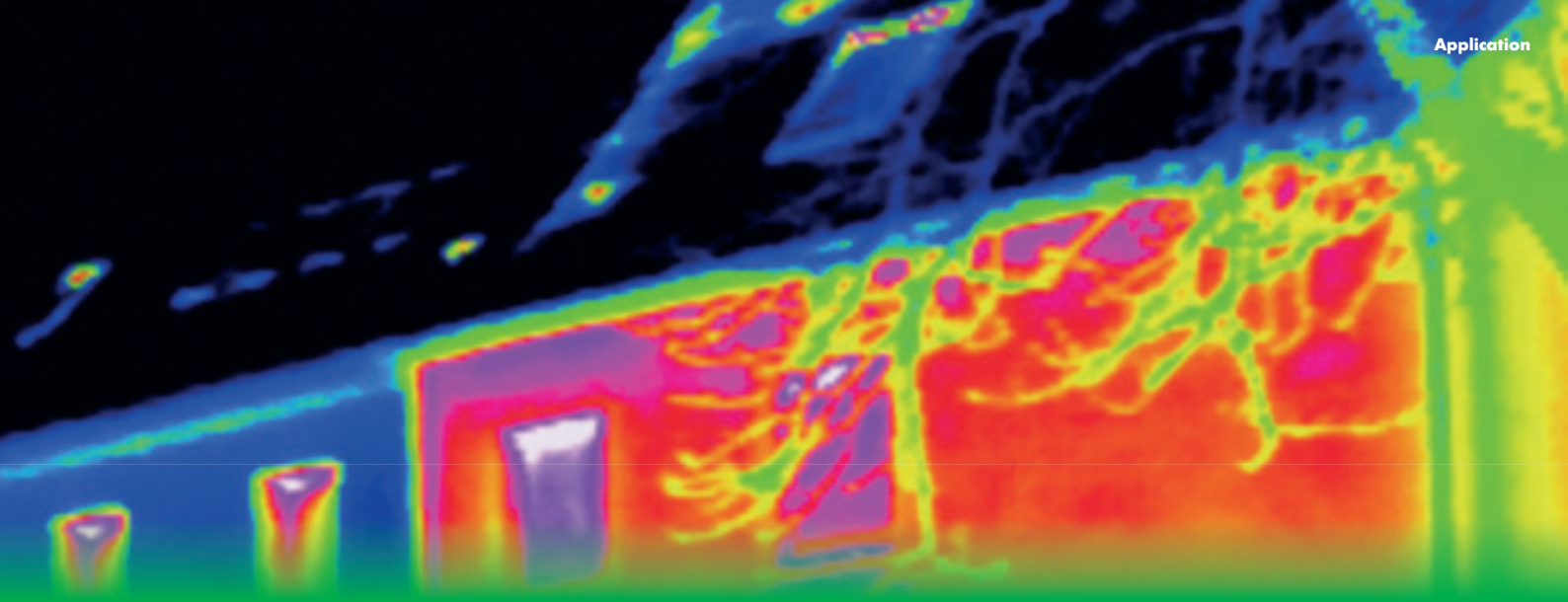
New wind farm in woods

NRW continues to accelerate the expansion of wind energy. At the fifteenth stop on his future-energy tour, NRW climate minister Johannes Remmel opened the new wind farm at Bad Laasphe. This facility is the first installation in a wood to be completed since the state government's new Wind Energy Directive of 2011 and the "Wind-Energy in Woods" guideline (2012). The six turbines are located on wooded sites on the Ahlertsberg hill, which was badly hit by Hurricane Kyrill in 2007, and should be able, with their total output of 18 MW, to meet the annual power needs of the 14,000 inhabitants of the town of Bad Laasphe. The project investor is Wittgenstein New Energy Holding, domiciled in the NRW town of Bad Laasphe. Woodlands cover more than a quarter of the surface of North Rhine-Westphalia. Siegen-Wittgenstein, Germany's most heavily wooded county, will benefit from the energy turnaround by using its woods as locations for the generation of renewable energy. As Johannes Remmel

remarked, "The example of Bad Laasphe shows us that wind energy has arrived in the woods! Modern wind-energy installations can be operated cost-effectively in woods because their spinner height of 140 m means that they make the high-wind, low-turbulence zones above the treetops commercially and technically exploitable".

As Ludwig Prinz zu Sayn-Wittgenstein-Berleburg, CEO of Wittgenstein New Energy Holding GmbH, commented, "We are particularly proud of the frank and open communication that has characterised this project since the very start of planning. This has promoted a high level of acceptance among the population". Compared to the project dimensions, the land requirement proved to be relatively small, totalling around two hectares for all sites, including access routes and space for cranes.

The Institute for Ecological Economy Research (IÖW) estimates the contribution of renewable energy to municipal wealth creation at 10.5 billion euros in 2010, with a forecast of over 13 billion euros for 2020. "A specimen IÖW calculation of the wealth generated by a 2 MW wind-energy installation across a period of twenty years indicates a figure of 2.2 million euros for the municipality when income resulting from new local jobs and profits is included. The construction of six such facilities simultaneously will multiply this correspondingly", predicts Stephanus Lintker, of EnergyAgency.NRW's Network Wind Power.



Aha moment from bright colours

Thermography aids energy consulting

Everyone likes it warm and cosy - but not at too much expense. Achieving this appears to be complicated: Energy-modernisation of buildings? Exterior insulation and overall heat transfer coefficient? Heating-boiler thermal performance and final-energy consumption? All Greek to many consumers, even those interested in saving energy. And then there is also often uncertainty in selecting the right advisors: Who will advise me impartially, and who just wants to sell me something?

The Consumer Centre NRW provides impartial advice with no commercial interests. The suggestions of its energy experts have for years been in ever greater demand by house owners wishing to modernise their properties. The interest of another target group focuses, in particular, on the annual winter thermography campaigns, which combine energy advice with an analysis of the thermal images of residential buildings. This service is particularly popular with private residents who are not planning any modernisation in the near future, but are, nonetheless, receptive to the idea of energy-efficiency and would like to have more knowledge about their home's performance here. A survey performed by the Consumer Centre NRW shows what it is that motivates consumers to make use of thermographic energy advice. This survey questioned 254 of 417 participants in three counties and three self-governing towns at the start of the campaign in 2012/2013. For four out of five house owners, this was the first energy advice they had received during the campaign. For two thirds, general interest in the energy performance of their building was the main motivation in applying. The remaining participants had questions concerning specific elements of their buildings, such as the windows, exterior walls and roofs. The survey also demonstrated that the combination of thermography and advice makes people curious, and generates incentives to consider modernisation. The majority of those questioned were receptive to such an idea.

The thermographic images bring home the otherwise abstract subject of "energy-efficiency" in older residential buildings at the emotional level. The Consumer Centre NRW's energy advice is of a preventative nature, and aims to help guide possible investments at a later time. For the energy consultants - in the main, university-trained architects and engineers - the colour images produced by the thermal cameras provide a good basis for explanatory talks: they enable them to illustrate the typical heat "leaks" in residential buildings and to explain the technical background. They thus expand consumers' knowledge of their homes, with "ah ha effects" included - thermography is able not only to unearth heat leaks at the boundaries of building elements, walls, doors and roller-blind housings, it also discloses surprising heating-cost wasters in such old buildings: badly sealed window masonry, for example, weaknesses in half-timbered buildings, and uninsulated radiator recesses and heating pipes in walls.

And the energy advice of the thermography campaigns goes well beyond multicoloured exterior images: a tour of the building quickly discloses energy weaknesses not even visible on the thermographic images, and in many cases totally unknown to the owners. These may include obsolete or poorly adjusted heating systems, building materials with poor insulating properties, and design faults. Such discoveries also provide building owners with incentives for modernisation.

Information: Martin Steinestel, Energy Efficiency Officer, Consumer Centre NRW, email martin.steinestel@vz-nrw.de

No thermography without energy advice!

From 1 December 2013, the Consumer Centre NRW will again be offering energy advice plus thermography in a large range of municipalities. Building owners can find out more about opportunities in their area by dialling 01801 / 11 5 999 or visiting www.vz nrw.de/thermoaktion. The advice provided is subsidised by the NRW state government and the European Union; the consumer's contribution is 190 euros. This covers thermographic images of the exterior of the residential building, a 90 minute talk with a Consumer Centre NRW energy consultant at the consumer's home, and a written report. The latter assesses the energy performance of the building, provides suggestions for structural and technical improvements, and outlines opportunities for financial assistance.

Christian Tögel elected to Forum Contracting advisory body

The "Forum Contracting" has a new advisory board member: Christian Tögel, of EnergyAgency.NRW, was elected at the meeting of members in Düsseldorf in July, 2013. He succeeds Martin Morguet, also of EnergyAgency.NRW, who died unexpectedly last year, having served on the advisory board for more than ten years.

Tögel is a university-qualified engineer in supply technology, and advises NRW companies and municipalities on questions concerning contracting. He was elected unanimously by the members. ■

From coal to green district heating

Garath, in Düsseldorf's "deep south", is a suburb built straight from the drawing board in the 1960s to provide adequate housing for the city's rising influx of residents; energy supplies were a central issue from the inception. The Garath cogeneration plant, its chimney stack a marker visible from afar, supplied the around 25,000 persons living in the new district with both heating and electricity.

At 61 kilometres system length, the district heating network constructed remains the largest of its type even today. The plant's original fuel was coal, with conversion to natural gas taking place in 1998. This change is also apparent from the new, metal, stack, reaching to a height of some 60 m; its brick-built predecessor was demolished. A more environmentally friendly biomass-fired cogeneration plant, fuelled with waste wood and thus significantly reducing gas consumption and CO_2 emissions, was completed in late 2007.

This year, an additional wood-pellet heating unit, small compared to the adjacent power plant, was commissioned to supply adequate heat in the transitional periods, in particular. This new facility raises the "green district heating" content of Garath's heating mix to over 50 per cent. ■

Inauguration of the wood-pellet heating plant by Dr. Udo Brockmeier, chairman of the Stadtwerke Düsseldorf municipal utility, Helga Stulgies, City of Düsseldorf Environmental Officer, Markus Mann, CEO of MANN Naturenergie and Isabel Dörr, of EnergyAgency.NRW (left to right)

"Climate-neutral" sporting ev

More than 2.2 million participants and more than 3,700 open-entry runs – Germany is running, as is shown by the German Athletics Association's statistics for 2012. Sport, with its large and diverse range of events and huge popularity, reaches virtually all strata of the population. People not actively involved are nonetheless likely to be one of many hundreds of thousands of spectators.

Sporting events touch on the necessities of climate- and environmental protection in many diverse ways. Participants and spectators travelling to and from events cause CO_2 emissions, as do catering facilities and on-the-road food consumption - often leaving behind copious amounts of waste - and the supply of hot water and electricity at the venue. And the almost obligatory "finisher" shirts have generally completed an energy-intensive voyage around the globe before reaching the owner's wardrobe. Initial CO_2-data surveys have shown them to exert an unequivocally negative effect on the climate. But there are numerous positive aspects, too: many of those involved, particularly on the running scene, are receptive to energy-efficiency and the conservation of resources. Sporting events are thus part of those social phenomena capable, given a positive framework, of boosting concern for climate-protection and each individual's options for action. For this reason, EnergyAgency.NRW has put together for

ClimateThemePark opens

"KlimaErlebnisPark" theme park inaugurated at NaturGut Ophoven, Leverkusen.

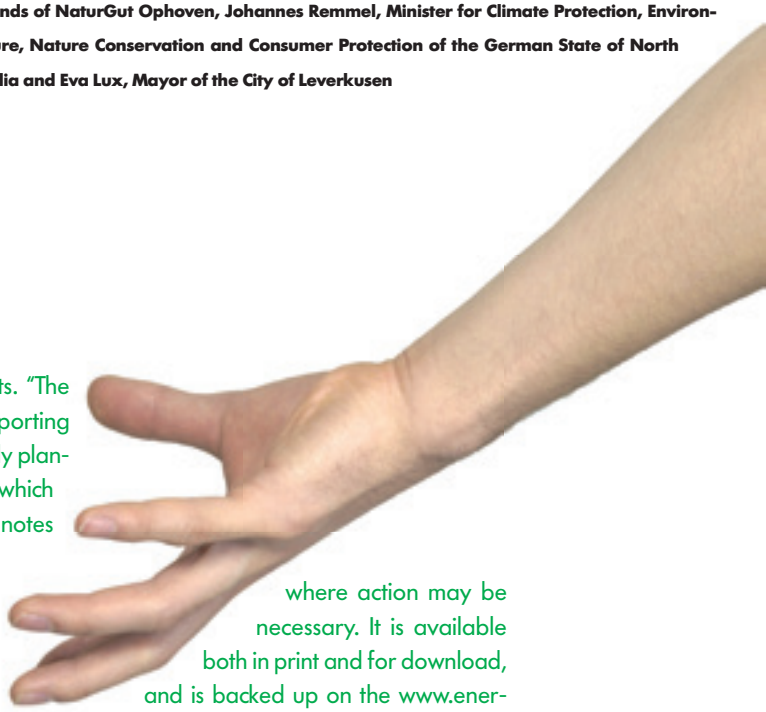
Seven interactive climate-information points, a garden planted with regenerable raw materials and the regenerable-energy catwalk show visitors simple but nonetheless effective ways of contributing to climate-protection. NRW's climate-protection minister Johannes Remmel recently opened the "KlimaErlebnisPark" climatic theme park at the NaturGut Ophoven nature reserve in Leverkusen. The NaturGut Ophoven site has been further developed into Germany's first climatic theme park with the financial support of the KlimaKreis Köln climate-action group, of Cologne. "Climate-protection is not just theory: the climatic theme park at the NaturGut Ophoven makes it a hands-on experience", Remmel affirmed in his speech. As he stated, the new theme park brings thinking and experience together in an imaginative way, and thus fills education in sustainable development with life.

Over a hundred useful tips and information on climate-protection, sixty interactive installations and fourteen recorded talks succeed in inculcating in visitors, in an interesting way, with no "lecturing", just how important climate-protection is for our future. "Everyone has innumerable opportunities of acting in a climate-aware manner in his or her everyday life, and our aim is to motivate our visitors to do this", comments Hans-Martin Kochanek, head of the environmental training centre. All aspects of everyday behaviour are covered, since active climate-protection means not only our use of energy, but also our consumption behaviour, our eating habits, and our mobility. Four "experience-the-climate" fields - "Water", "Sun", "Wind" and "Earth" - inform guests on climate-friendly regenerative energy sources. The climate-information points and other displays contain a large amount basic information, although only a brief examination of the numerous topics is possible here. For this reason, very many of the displays feature QR codes, enabling visitors to learn more using their smart phones. Five new teaching units have been developed, to permit optimum use of the new installations with schoolchildren. The NaturGut Ophoven's experience in climate-protection education at its site is to be compiled, and thus passed on, in the form of a handbook, "Climate-education in nature", for non-school places of education and interested environment teachers. ■

The joint opening of the "KlimaErlebnisPark" climate theme park by Professor Dr. Marc Oliver Bettzüge, chairman of the "KlimaKreis Köln" climate action group, Cologne, Dr. Hans-Martin Kochanek, head of NaturGut Ophoven, Ivonne Bemmann, project manager of the theme park, Marianne Ackermann, chairman of the Friends of NaturGut Ophoven, Johannes Remmel, Minister for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection of the German State of North Rhine-Westphalia and Eva Lux, Mayor of the City of Leverkusen

ents

sports clubs and associations, event organisers and municipal representatives a free practical guideline which assists in climate-friendly organisation of such events. "The organisers of a 'climate-neutral' sporting event generally look during the early planning phase at a range of aspects in which CO_2 emissions can be avoided ", notes Michael Müller, of EnergyAgency. NRW. "For this reason, we are launching our guideline now, in the run-up to events that will be held in 2014". The guideline is based on "best practice" examples from NRW (the Siegerland company marathon and the steinhart500 crossmarathon) and provides a concise introduction to the various areas where action may be necessary. It is available both in print and for download, and is backed up on the www.energieagentur.nrw.de Internet site by detailed check-lists and a "CO_2 event calculator". Further information: email michael.mueller@energieagentur.nrw.de ■



The right office temperature

Offices are saving a lot of heating costs nowadays. Temperatures are lowered in the evening, after the end of office hours, and raised again in good time before everyone arrives the next morning.

The unlucky ones who work later or start earlier just have to freeze, as do those summoned to a late-evening conference to keep an urgent order on track. And these are not even the worst drawbacks of this "one-size fits all" system - in large office complexes, dozens of offices remain empty every day because their occupants are ill, on holiday or on a business trip. Practically no one then thinks to turn the radiators down - who wants to come back to a freezing cold office? The caretaker, of course, would be totally overwhelmed if he were expected to lower the office temperature when the occupant is away, and then make sure of a pleasant working temperature before he or she returns.

But there's a lot of money that could be saved here - up to 30 per cent of overall heating costs, according to Innoventure Business Consulting, of Aachen, who have developed the "InnoConomy" system, which assures precisely the right control of office temperatures. The system necessitates the fitting of radio-controlled thermostatic valves to all radiators; these cost less than fifty euros each, and can be fitted as replacements for the original valves in less than a minute each. They receive their instructions from a fully automated control centre which obtains information on the presence or absence of every employee from the corporate software package which registers all attendance and non-attendance times. The company can adapt its software to any existing corporate software system.

In practice, this works as follows: An employee's application for leave is entered in the company's system when it is submitted. This software alerts InnoConomy immediately. The thermostatic valve reduces the temperature on the dot when the employee's vacation starts, maintaining it at, let's say, 10° Celsius. The temperature is then restored to its normal level during the early morning of the day of the employee's return to work. The procedure is exactly the same in case of employee illness and business trips. The system even lowers the temperature if the employee is away for only a few hours.

Anyone who has particularly irregular working hours and is considered sufficiently trustworthy by the company is given permission to decide independently when his or her office should be nice and warm, and when costs are to be saved. He or she can then override the corporate software, using a tablet PC or a smartphone, plus an access code.

The system is intended for use in municipal administration and in industry, and makes it possible, for instance, to heat school classrooms only during actual teaching periods. The temperature in gymnasiums could, for example, be changed to match the sports taking place - a couple of degrees cooler for handball training than for an aerobics session or family gymnastics. Air-conditioned rooms can also be integrated into this control system.

According to Innoventure chief executive Hubert Laschet, it is possible in this way to save up to 30 per cent of heating costs. "The first-costs for the system can therefore be recouped within two years in many cases", he claims. This would mean annual savings of one billion euros in German municipal, state and federal buildings alone. ■

Author:
Wolfgang Kempkens

Hand-held input unit for individual temperature control

Two virtual institutes

The energy turnaround presents great technological, economic, social and cultural challenges for society, the political world and industry in North Rhine-Westphalia. For this reason, the sustainable transformation of NRW's energy-supply system is in future to receive scientific support from two new virtual institutes, "Transformation-EnergyTurnaround.NRW" and "Power to Gas and Heat". The NRW science ministry is subsidising the setting-up of these two institutes, which are expected to generate pro-active impulses for decision-makers in government and industry. The institutes will group together the capabilities of the state's most important universities and research facilities working in this field, making a significant contribution to the success of the energy turnaround and to the important research being performed in this sector in North Rhine-Westphalia. Information: www.cef.nrw.de ■

Building modernisation on test

In its energy concept, the last federal government set the target of achieving virtually climate-neutral buildings throughout Germany by 2050. A doubling of the rate of energy modernisation, from an annual around 1% to 2%, will be necessary to meet this aim. This target is not even on the distant horizon, however - in North Rhine-Westphalia alone, around two thirds of buildings do not yet meet energy requirements, and owners appear sceptical. The reasons for this are many and varied: a major portion of property owners, and of landlords, in particular, are of the opinion that energy-modernisation is not financially worthwhile. The available subsidies are also considered to be too low, and marginal potential depreciation for tax purposes provides no incentives for the necessary investments. Possible difficulties with tenants, the fear of damage to building fabrics, too little involvement in legislative processes and complex available information reinforce this scepticism and obstructionism on the part of owners when the subject of energy-modernisation of buildings is raised.

It will be necessary to find conceptual solutions which make allowance for owners' worries and prejudices, without neglecting the financial interests of tenants, if the frequency of energy modernisation is to increase. Other persons involved in the modernisation process, such as architects and financial advisors, will also have to be integrated. And more intensive interchange between the pivotal persons at state, regional and municipal level is also needed to overcome entrenched attitudes. Carefully progressing campaigns aimed at specific target groups and based, wherever possible, on co-operation between influential personalities, are equally vital. Energy modernisation of buildings should be understood as only one element in an overall modernisation process, and not as the "ultimate solution". This means that the aim must be a holistic approach which will generate synergies between different forms of modernisation and assure investment certainty. Not the least important requirement is also expansion of the use of renewable energy in energy modernisation at individual building, district and regional level.

KLIMA DISKURS NRW

The participants at the "Has Germany gone insulation mad? Energy modernisation of buildings on test" workshop, held in the context of the KlimaDiskurs.NRW KLIMA.WERKSTATT climate workshop, evolved these and other approaches. This recently founded not-for-profit association has as its aim public debate on divergent interests, organised under focal climate-protection topics, the identification of points of consensus, and the delineation of paths to joint action. The likelihood of conflict is accepted. KlimaDiskurs.NRW sees itself as an impartial platform, via which the various parties can be systematically brought into communication with one another. Further information: email alice.berger@klimadiskurs-nrw.de, www.klimadiskurs-nrw.de.

Study examines rebound effects

It will not be possible to attain our climate- and energy-policy targets without better insulated buildings, more economical cars and more efficient domestic appliances. The problem is that rising energy-efficiency may actually increase overall fuel and power consumption - to such an extent, in an extreme case, that the economies achieved by more efficient technology are cancelled out completely. Experts call this phenomenon the "rebound effect". Purchasing power freed by energy savings causes consumption to rise further - consumers then spend the money that they have saved on gasoline, for example, on other energy-intensive products and services, such as holidays abroad. A scientific study by the E.ON Energy Research Center at RWTH Aachen University aims to obtain new knowledge on rebound effects in NRW specifically, and to evolve corresponding provisions and methods for minimising them. This study is receiving financial support from the NRW science ministry. Information: www.cef.nrw.de

CO_2 inventory in the Münsterland

Nearly three hundred NRW municipalities are now using the 'ECORegion' CO_2 inventory programme to analyse their greenhouse-gas emissions. NRW, with 72% of its municipalities participating, is the European leader in the systematic quantification of these emissions. These municipalities draft a CO_2 inventory on uniform criteria, and are thus able to identify local climate-protection strengths and weaknesses on a long-term basis.

A good example: the activities of the Münster regional administration, where a decision was taken as early as 2011, in agreement with the Counties of Borken, Coesfeld, Steinfurt and Warendorf, and also the self-governing city of Münster, to draft for all sixty-six municipalities and the four counties of the Münsterland region so-called municipal profiles on energy consumption and CO_2 emissions. The co-operation partner on this project is the "Energy • Buildings • Environment" faculty at Münster University of Applied Sciences. The profiles show in simple and easily comprehensible form not only the individual municipalities' energy and structural data, but also the main results of the municipal CO_2 inventories compiled in parallel. This data provides municipalities confronting these problems for the first time with a useful basis for the data surveys necessary for extrapolated forecasts.

Tight networking of the persons active in CO_2 balancing in the Münsterland is planned at municipal, county and regional-government level for the future. The aim: improved availability and easier acquisition of data.

The counties and the regional governments are, in general, increasingly recognising the informational value of CO_2 balances for their individual administrative territories. They need the permission of the towns and municipalities concerned to access municipal CO_2 balances directly, and thus draft a so-called "bottom-up" balance, however. Such supra-authority co-operation does have its attractions for the municipalities: more and more local and regional governments are now performing important service functions for their municipalities.

Another pace-setter for CO_2 balancing is climate networker Rüdiger Brechler, who started work with the Münster regional government in the spring of 2013. "To provide even more support for all the region's counties and municipalities, the Münster regional government, in co-operation with EnergyAgency.NRW, has been providing free-of-charge training courses in the use of the 'ECORegion' software since October, 2013", he reports. "The close co-operation between EnergyAgency.NRW, the regional government and the municipalities sets examples for all participants for the achievement of our common aim of climate-protection", as Gregor Lange, the Münster regional government's responsible regional planner, also confirms on the positive benefits of this co-operation for the region as a whole.

Further information: Klaus Lauer, responsible officer at the Münster regional government, email Klaus.Lauer@brms.nrw.de; Tel.: +49 (0)251/4111800 and Rüdiger Brechler, Climate Networker at the Münster regional government, email brechler@energieagentur.nrw.de, www.co2.nrw.de; Tel.: +49 (0)251/4115907 ■

More fuel-cell cars on test

EnergyAgency.NRW is long-term testing another fuel-cell car. Rolf Löffler, of the Ford Research Center, in Aachen, recently handed over the keys to a Ford Focus FCEV Hybrid to Dr. Frank Koch, of the Network Fuel Cell and Hydrogen NRW (photo: left). The vehicle's fuel cell has an output of 72 kW, while its 350 bar pressurised tank can hold around 4 kg of hydrogen. The car is fuelled at the gas station in Düsseldorf's Höherweg. It was first registered in 2004 and has since been providing reliable service, and thus demonstrating the durability of fuel-cell systems. "We are particularly interested in comparing the range, noise emissions and everyday operability of modern fuel-cell vehicles with those of earlier generations", explains Frank Koch. EnergyAgency.NRW also has another fuel-cell vehicle on test, an Opel Hydrogen 4. ■

Fukushima, Minnesota and Georgia are...

...three international EnergyAgency.NRW partners

The Japanese prefecture of Fukushima has come to international public attention since the nuclear disaster that occurred there. Until 2011, Japan had focused intensely on nuclear energy, but the country also has enormous potential regenerative-energy resources, in the form of wind, solar, wave and geothermal energy, in particular. The Japanese economics ministry states that around 6.8 GW of photovoltaics (+40%) and 2.9 GW of wind-energy capacity had been installed by the end of 2012. To these figures must also be added some 9.6 GW of hydropower and 2.2 GW of biomass power-plant capacities. Much room for expansion thus remains, in wind energy, in particular, where there are potentials of 280 GW for on-shore installations alone.

Japan also has attractive feed-in payment rates, of 38 yen - equivalent to around 29.5 eurocents - per kWh of solar power. The Prefecture of Fukushima, in particular, has now adopted the expansion of renewable energy in style, organising in early November its second "Renewable Energy Industrial Fair", at which EnergyAgency.NRW and six NRW companies took a joint stand and held a symposium to supply information on our state's technologies and activities in this field. Johannes Remmel visited the prefecture in February to assess the present situation for himself and show support. A delegation from Fukushima is to visit the E-World fair in Essen in February, 2014, with the aim of furthering interchange between these two regions.

USA: Minnesota and Georgia

The individual states of the USA are among North Rhine-Westphalia's most important co-operation partners, and EnergyAgency.NRW has been a member of the American Council on Renewable Energy (ACORE), one of America's leading renewable-energy networks, since 2011. The overriding aim of US energy policy is self-sufficiency in electricity.

In addition to its vast fossil-fuels resources, the USA also has high renewable-energy potentials, and has already installed high capacities. At 60 GW capacity, the country ranks second in the world, after China, in wind energy, for example, and generates 13 per cent of its power from renewable energy sources. Alongside inducements at national level for the expansion of green energy, such as tax concessions and investment incentives, the individual US states also provide differing degrees of support for renewable energy. Georgia and Minnesota, for example, are important promoters of the American energy turnaround, and the NRW environment ministry, together with EnergyAgency.NRW and these two US states, is holding a symposium on 5 December to exchange ideas and information on the implementation of energy-efficiency provisions and the expansion of the use of regenerable energy at regional and municipal level.

The southern US state of Georgia is increasingly backing renewable energy, and is the south-eastern USA's leader in this field, thanks to its bio-energy industry. The world's largest wood-pellet installation was commissioned in the south of the state in 2011. The solar industry also plays an important role, since Georgia enjoys one of the sunniest climates of the south-eastern region.

With an installed wind-energy capacity of 2,700 MW, the northern state of Minnesota is the US leader in this field, and is also aiming to expand its solar capacities. A "solar directive" adopted this year envisages an increase from 13 MW to 450 MW by 2020.

More information on Japan and the USA can be found at the EnergyAgency.NRW website: www.energieagentur.nrw.de/international

Bielefeld: The Breipohls Hof climate estate

The state government's "100 Climate Protection Estates in NRW" project aims to reduce heating-induced CO_2 emissions from residential estates (both new housing and modernisation projects).

At the sixteenth stop on his "Future energy tour", accompanied by an EnergyAgency.NRW delegation, the state's climate minister, Johannes Remmel, opened the new Breipohls Hof climate estate in the Bielefeld district of Senne.

The "100 Climate Protection Estates in NRW" project is coordinated by EnergyAgency.NRW on behalf of the state. "The project permits the use of all technologies suitable for cutting CO_2 emission in new construction and in modernisation projects. Planning consultancies and investors can thus choose from a large range of innovative building standards and supply models", the minister noted.

The v. Bodelschwingh Foundation Bethel has constructed a senior-citizens centre, with residential care groups and disabled-friendly apartments, at Breipohls Hof. The climate-protection estate project includes the construction of a new eighty-bed care centre, and seventeen residential units, on a site totalling of some 4,000 m².

New passive-house building complex

"The care centre is notable for its exceptional energy-efficiency, and for the use of renewable energy", affirms Andreas Gries, EnergyAgency.NRW manager of the "100 Climate Protection Estates in NRW" project. The building complex, planned to conform to passive-house standards, is of self-supporting design with a 20 cm thick exterior insulation finishing system. A set-back upper floor is of timber-frame construction with 24 cm thick insulation. The basement is also included in the "thermal shell", since staff amenity rooms are situated there. A central ventilation system incorporating heat recovery has also been installed. Energy for heating is supplied by a gas-fired condensing-type appliance and a mini CHP plant unit; This CHP unit will assure around 70 per cent of heating needs, and the gas-fired boiler the remaining approx. 30 per cent. A photovoltaics installation with an output of some 28 kilowatt peak (kW_p) will also assist in cutting CO_2 emissions.

Needs-based architecture and smart building automation

"Needs-orientated modern architecture and the use of smart systems in building automation and the immediate living environment help to reduce emissions harmful to the climate, on the one hand, and provide greater safety and a better life for older people, on the other", explains Ulrich Strüber, from the management of the Care for the Aged division of v. Bodelschwingh Foundation Bethel. The Breipohls Hof senior-citizens centre features a secure garden (the "Garden of the Senses"), in order to meet the special needs of persons suffering from dementia. Further technical assistance systems, aimed at enhancing residents' safety and convenience, have also been installed in co-operation with Duisburg's Fraunhofer inHaus centre.

Bielefeld is soon to have two more climate-protection estates, one at Pauluscarree (construction work started) and another at Sennestadt (currently at the planning stage).

Further information:
www.100-klimaschutzsiedlungen.de

NRW takes three of eight solar awards

German Solar Award 2013 for the NRW climate ministry

The NRW Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection has been acclaimed, with its receipt of the German Solar Award at Bonn's prestigious "Kunstmuseum" art museum, for its two "Fifty Solar Estates in NRW" and "100 Climate Protection Estates in NRW" projects. Both are being coordinated by EnergyAgency.NRW.

"This German Solar Award is in recognition of our state's powers of innovation, particularly in the field of energy-modernisation and future-orientated construction. Change always necessitates new ideas and commitment, more so than ever in this period of energy turnaround. So the German Solar Award not only rewards past achievements - I also see it as an incentive to continue our commitment to sustainability in the field of construction", commented NRW climate minister Johannes Remmel. Dr. Heinz Baues, head of department at the NRW climate-protection ministry, deputised for the minister at the ceremony, and accepted the award from the jury. The German Solar Award is presented once annually by Eurosolar for exemplary commitment to renewable energy. This is the first time it has been won by a government ministry.

NRW also received two further prizes: one, in the category "Cities and Municipalities" went to the City of Dortmund, and the other to the "Help - for self-help" association of Bonn, in the category "One World Co-operation". Dortmund's award was in recognition of its "100 Plus-Energy Houses for Dortmund" campaign; these one hundred buildings are to be completed by 2020 and will generate more energy than they consume. The "Help – Help for Self-help" association has been assisting refugees in eastern Chad since 2004, assuring water supplies at the Nabak camp for some 13,000 Sudanese refugees from Darfur. The power for the necessary pumps was converted to solar energy in February, 2013. NRW's climate-protection ministry received prizes in the "Special Prize 20 Years German Solar Award" category for its "Fifty Solar Estates in NRW" and "100 Climate Protection Estates in NRW" projects.

The state government of North Rhine-Westphalia started its project for construction of fifty solar estates in the late 1990s as part of its energy and climate-protection strategy. These solar estates, which have now been imitated throughout Europe, were intended to illustrate the options for the use of solar energy and to generate new impulses in solar building. "This holistic concept is aimed not only at optimising energy use and supply, it is also important for its social, ecological and urban-development aspects", was the jury's verdict. "Forty-five estates have now been constructed, with another five due for completion in the near future. Around 4,200 residential units have been created up to now, and more than 10,000 people are already living in solar estates, with the benefit of extremely low subsidiary costs", according to Dr. Frank-Michael Baumann, the director of EnergyAgency.NRW. The follow-up project, "100 Climate Protection Estates in NRW" initiated in 2009 utilises previous solar-estate perceptions, and continues the pursuit of further innovations. Planners and investors can choose from a large range of modern building standards and technologies, the overall aim being the promotion of environmentally responsible building as an important element in the development of sustainable residential housing. Recognition as "climate-protection estates" has now been accorded to fifty-six projects incorporating 3600 residential units. Such estates have up to now been completed in Gelsenkirchen, Bonn, Cologne, Bielefeld, Düsseldorf, Hürth and Münster; work is ongoing on another twenty-two projects. Further information: Andreas Gries, EnergyAgency.NRW, www.100-klimaschutzsiedlungen.de and www.50-solarsiedlungen-nrw.de

In brief

Solar citizens: "My electricity euro"

The energy turnaround from the ground up - this, or something very similar, could be the motto of the "Solarbürger", or "solar citizens", foundation, which aims to install solar panels on schools, nursery schools and other facilities for young people throughout Germany. To bolster regional economies, these systems are to be installed by local craft-trade companies. According to the foundation, Germany has around 50,000 childcare facilities, and some 30,000 schools. The campaign is to be funded by an annual one euro donation to the foundation by every federal citizen, one of the first donors being federal environment minister Peter Altmaier. Donations to: Stiftung Neue Energie, Beneficiary: "Solarbürger", Account No.: 19 19, at the GLS Gemeinschaftsbank eG Bochum, Sort Code: 430 609 67. For further information, visit: www.stiftung-solarbuerger.de.

The Förder.Navi gets you there faster

You need ideas, commitment and initiative to take an active part in the energy turnaround. But these alone are not enough - hard cash is also needed for the necessary investments in new, more energy-efficient and climate-friendly technologies. Fortunately, assistance is available - the State of North Rhine-Westphalia and the federal government are supporting many provisions aimed at saving energy, increasing the use of renewable energy, and climate-protection. The main thing is to get the right information on the appropriate subsidies, and the Förder.Navi shows the way - EnergyAgency.NRW's new on-line tool now helps you find the right programmes even more quickly and accurately. www.foerder-navi.de

New Masters degree course at the Bergische University

Demands for social, economic and ecological sustainability confront commercial companies with new challenges, the tackling of which necessitates greater attention at company-management level to the planning, design and monitoring of processes and structures relevant to sustainability. The Bergische University of Wuppertal has for this reason launched its Masters course in Sustainability Management. The involvement of the Wuppertal Institute for Climate, Environment and Energy GmbH makes it possible to integrate new research results from national and international projects into the course curriculum, which also includes project management and risk controlling in resources-intensive industries, such as the energy sector. Further information: www.wiwi.uni-wuppertal.de

"Climate-protection plan" congress on 11 December

EnergyAgency.NRW and the state's climate-protection ministry are holding a "Climate-protection plan NRW" municipal congress in Wuppertal on 11 December 2013. Detailed strategies and provisions for the attainment of climate-protection targets are currently being elaborated, under the NRW climate-protection plan, which itself is being drafted with the intensive involvement of representatives from municipalities and municipal umbrella organisations and all the relevant persons in a broadly based - and Germany's largest - process of dialogue and participation. Attendance at this congress is restricted to the representatives of municipalities, municipal enterprises and municipal umbrella organisations from NRW. Register at: www.energieagentur.nrw (dates and deadlines)

New hydrogen brochure

EnergyAgency.NRW has published the latest edition of its Network Fuel Cell and Hydrogen NRW's hydrogen brochure to coincide with the start of the second phase of the "NRW Hydrogen HyWay" project. It bears the title "Hydrogen - the key to the energy turnaround", and its seventy pages provide readers with useful knowledge on future energy resources. Featured authors from management and industry have contributed articles on the production, logistics and numerous other aspects of the use of hydrogen. The new brochure can be obtained free-of-charge, either in a print or an on-line version, from the EnergyAgency.NRW Internet homepage.

"Shaping progress" congress

How must the future of energy supplies look? What concepts are there for future energy management and activities? Science minister Svenja Schulze and economics minister Garrelt Duin will be discussing North Rhine-Westphalia's potentials for the evolution of solutions to the global challenges of the future with experts from science, industry and society in Düsseldorf on 2 December 2013. Further information and registrations: www.wissenschaft.nrw.de